

This presentation premiered at WaterSmart Innovations

watersmartinnovations.com





EAST BAY MUNICIPAL UTILITY DISTRICT

WaterSmart Toolbox:

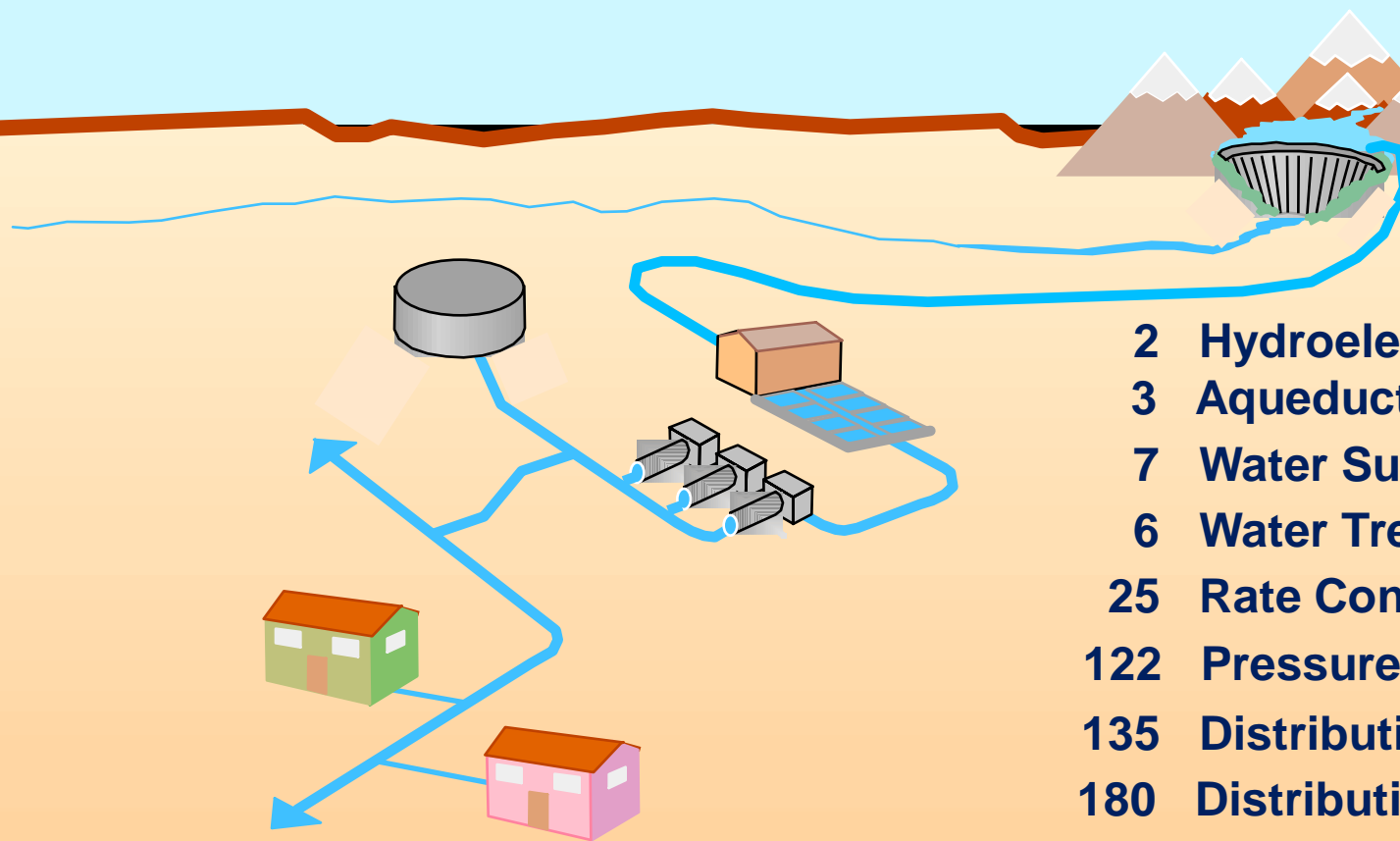
Giving Customers On-line Access to
Real-time Water Consumption is the
Right Tool For Water Efficiency Success

Richard Harris
David Wallenstein

2010 Watersmart Innovations
Conference & Exposition



EBMUD Water System Facilities



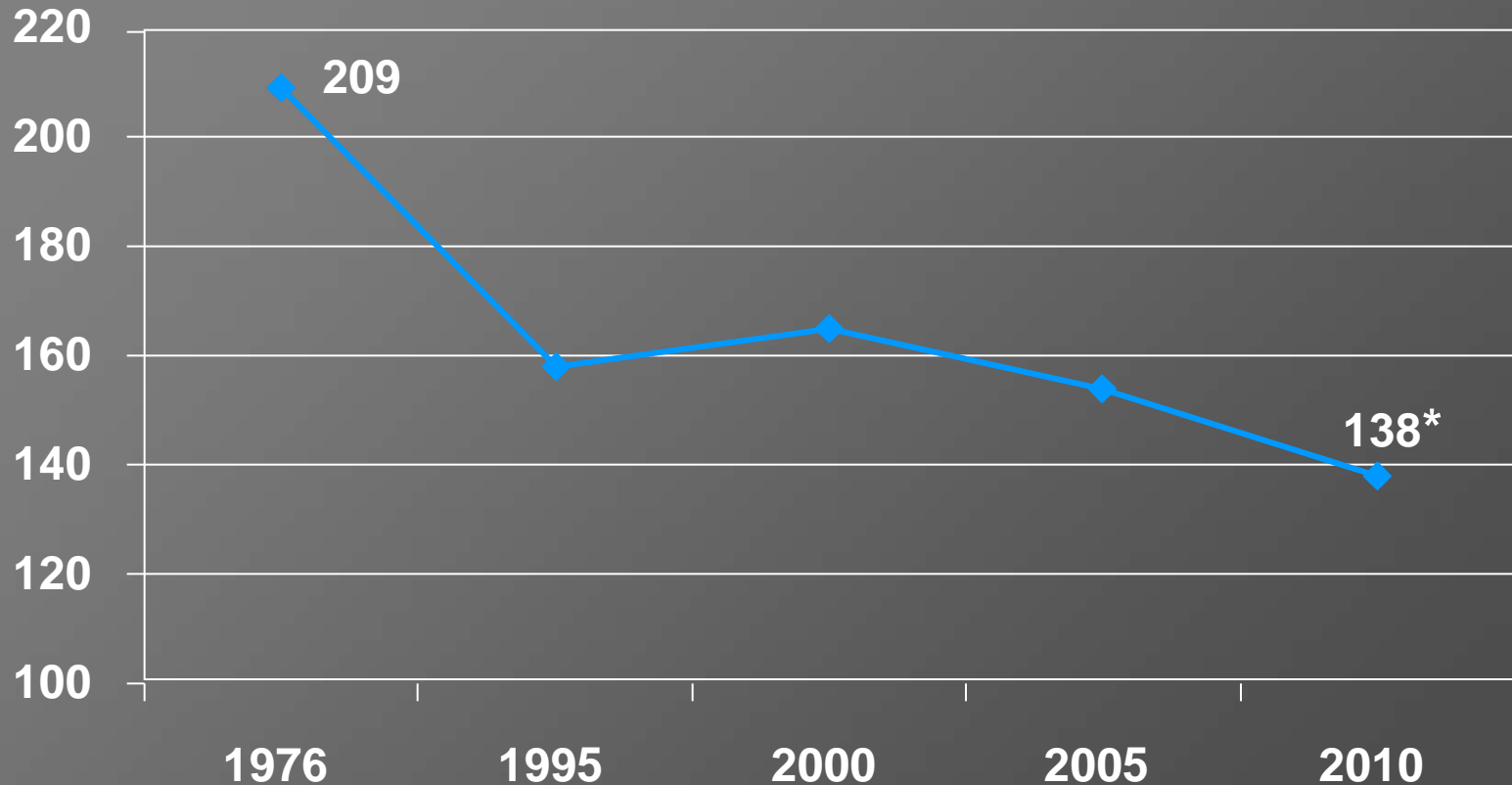
- 2 Hydroelectric Plants
- 3 Aqueducts (90 mi)
- 7 Water Supply Reservoirs
- 6 Water Treatment Plants
- 25 Rate Control Valves
- 122 Pressure zones
- 135 Distribution Pumping Plants
- 180 Distribution Reservoirs
- >4,000 Miles of Distribution Pipeli
- Elevation: MSL – 1,450 ft

1.34 Million customers

2007 Water Production = 210 MGD

EBMUD WATER CONSUMPTION

Average gallons per capita per day (1976-2010)



** Projected*

Conservation Incentives



High-Efficiency
Urinals



High-Efficiency
Toilets



Irrigation
Controllers

Showerheads



Pre-rinse
Spray
Valves



Water Efficiency Benefits



- 💧 Lower water bills
- 💧 Reduced wastewater charges
- 💧 Lower energy costs
- 💧 Reduced cost of pretreatment
- 💧 Positive public image
- 💧 Improved process controls
- 💧 Reinvestment/reallocation of savings



Inefficient Landscape Designs



CII Large Landscape Case Study

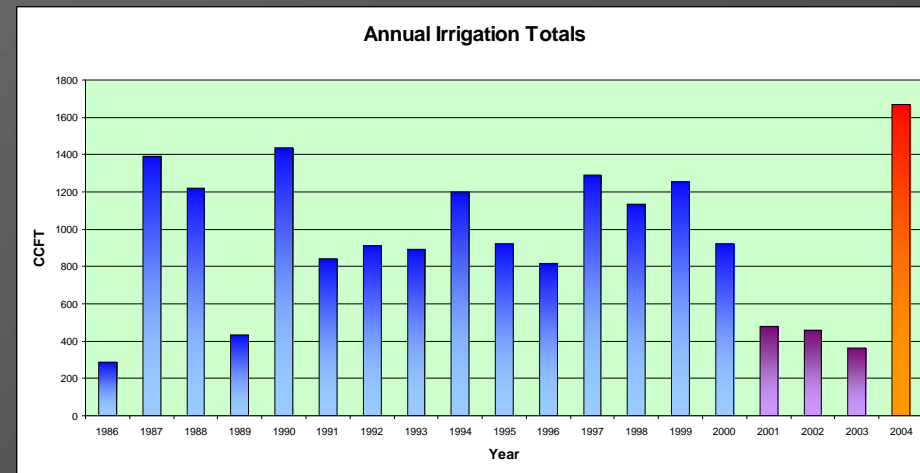


- Used free site survey
- Historical over-watering
- Landscape Rebate Recipient
- Improper Irrigation
- Proper Management

Water management is key



- 1st yr 48% water savings
- 2nd yr 50% savings
- 3rd yr 60% savings
- 4th yr 500% increase!



EBMUD Customer Survey Response: Little Knowledge About Water Use



- 💧 60% of single-family respondents thought they used < 50 gpd per household
- 💧 Actual averages 230–480 gpd
- 💧 WaterSmart Toolbox Pilot Study customer demand up to 5,000 gpd



Council faces 'staggering' budget cuts

Numbers
are grim
on jobless
January 11, 2009

Freeze plans to cut 800 workers

No easy cuts for schools

Stocks slide

No easy
answers
for ailing
economy

bailout aid

Google cuts

Freeze hits hard at public universities

All-time
low for
consumer

**11.1 million
Americans
out of work**

Budget
Administrators
construction

**STATE OFFICES TO SHUT
2 DAYS EVERY MONTH**

Advanced Metering Infrastructure (AMI)



An EBMUD Meter Reader during World War II



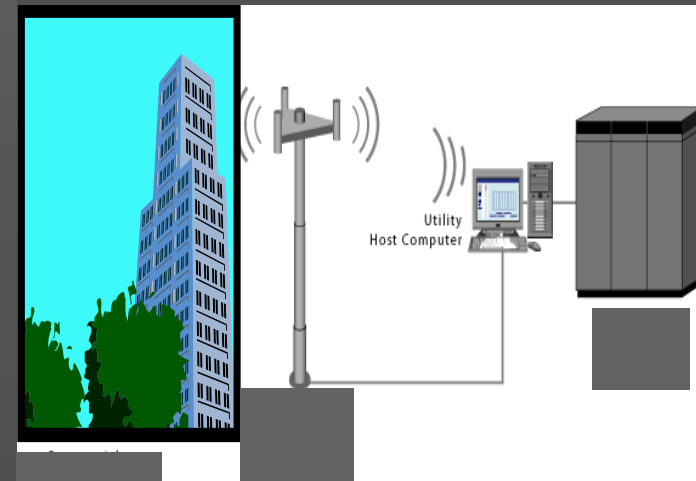
An EBMUD Meter Reader today



Automated Meter Reading (AMR)



- 💧 Meter reads via radio signal
-equipment installed in
meter boxes and on
District facilities
- 💧 Mobile Systems – walking
or driving
- 💧 Fixed Systems – collector
sends information to a
remote site computer



EBMUD AMR/AMI Pilot Studies (2002 – 2010)



💧 Mobile Network

- 400 meters
- 3 vendors

💧 Fixed network

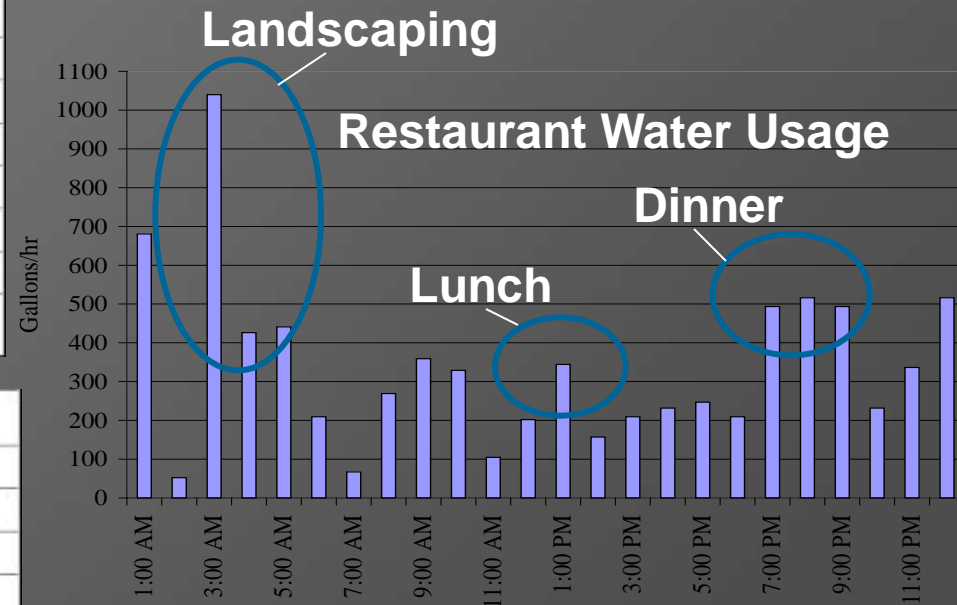
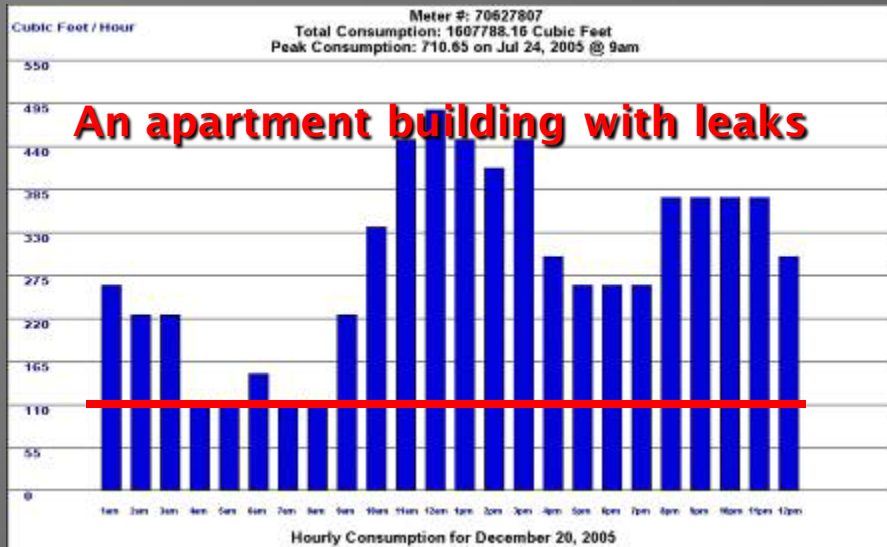
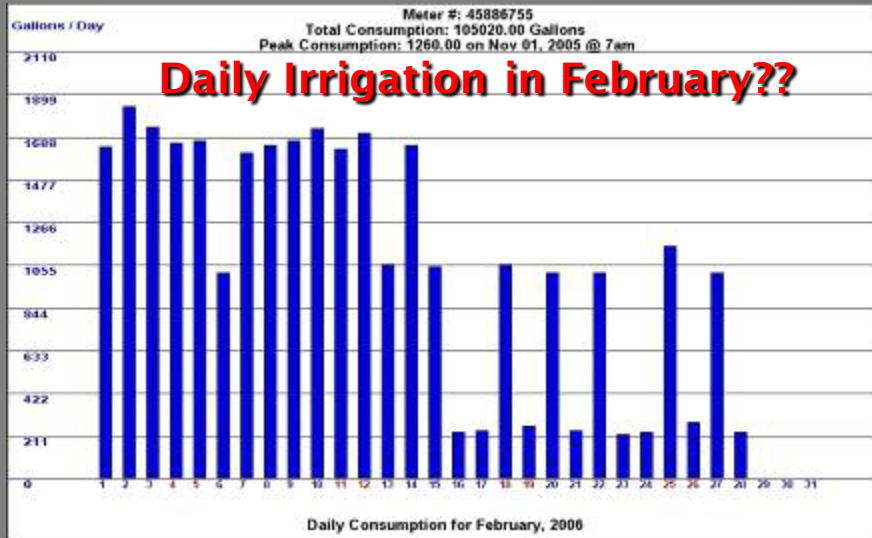
- 4,230 meters
- 3 vendors

💧 Customer mix

- 💧 Large homes w/med sized lots
- 💧 Townhouses & multifamily
- 💧 Commercial offices, restaurants, irrigation



Sample AMR Customer Profiles



Pilot Study Findings



- A surprising number of leaks
- Over irrigation common
- Water flow rates exceed meter warranty
- Revenue loss from meter inaccuracy
- Favorable customer feedback on web access
- Technology still being debugged and improved
- Avg. 20% reduction in use

The Blackhawk Project



- Fixed network
- Web Based
- 4,000 meters
- 10 Square Miles
- 7 collectors
- Hourly reads
- Meter sizes
5/8 to 6 inch
- Go Live 2010



Web hosting enables customer self-service access



- 💧 Pre-loaded 10 years of historical water use
- 💧 Charts of monthly, daily and hourly use
- 💧 Notification of leaks and high daily use warnings
- 💧 Customized daily budget including ET data
- 💧 Administrative staff website allows data mining
- 💧 Coordinating technology w/other conservation services
- 💧 Grant funding from California DWR and USBR

WaterSmart Toolbox- Customer Annual Use



Welcome to WaterSmart Toolbox!



WATER USAGE

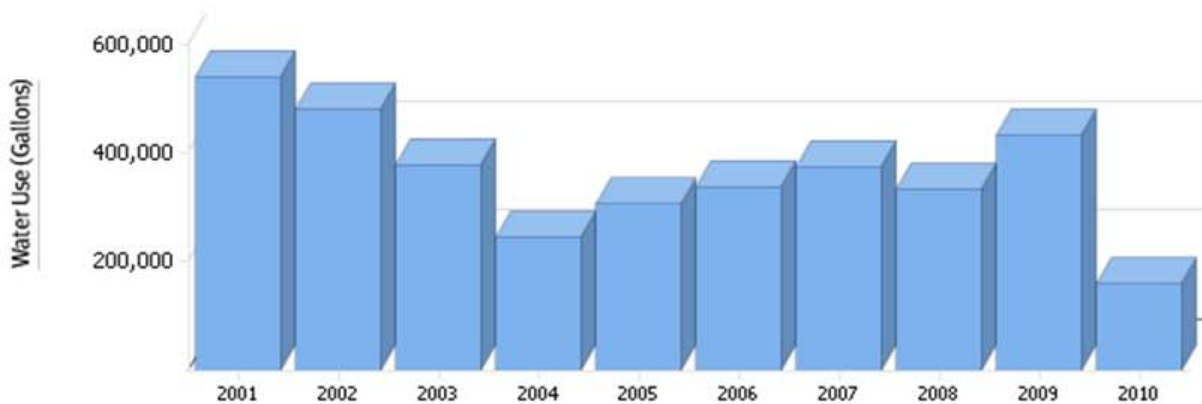
SETTINGS

Account
#34739632

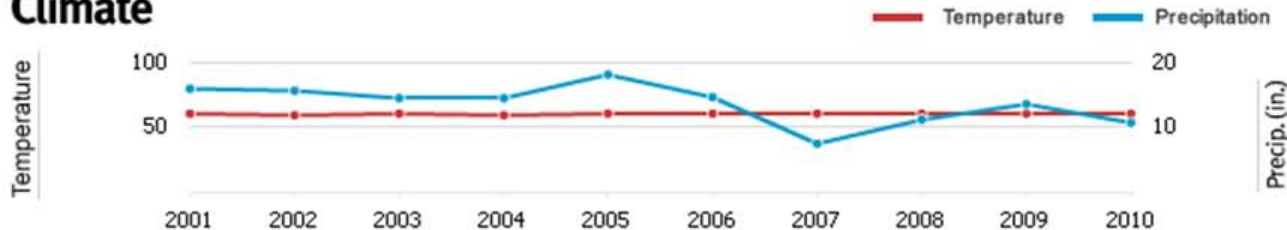
[Sign Out](#)

Yearly Water Usage

Last 10 years



Climate



Quick View

Yearly Monthly Daily Hourly

[Table View](#)

Climate

- ☒ Temperature ?
- ☒ Precipitation ?

Settings

[Edit](#)

Chart Units: **Gallons**

Daily Limit: **ON**

Alert sent at 2000 Gallons

Leak Detection: **ON**

Threshold set at 0 Gallons

Download Report ?

Enter timeframe

Water Use:

Choose ...

DOWNLOAD

WaterSmart Toolbox- Customer Monthly Use

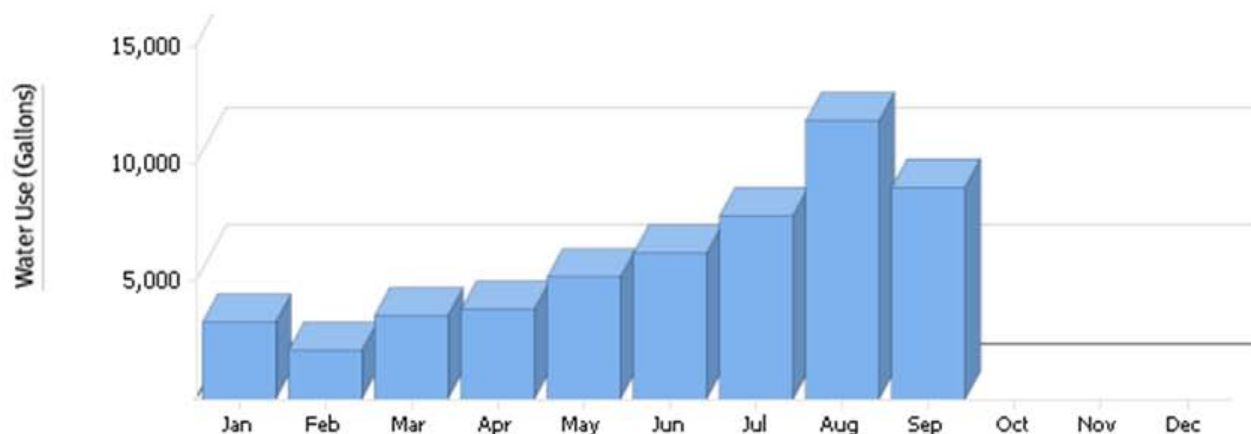


User Lookup

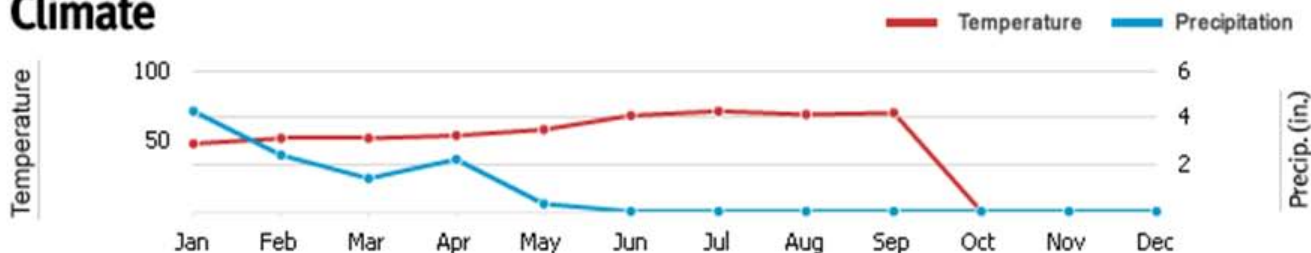
Account #123451

Monthly Water Usage

Monthly usage for 2010



Climate



Quick View

Yearly Monthly Daily Hourly

[Table View](#)

Climate

- ☒ Temperature ?
- ☒ Precipitation ?

Settings

[Edit](#)

Daily Limit: **ON**
Alert sent at 100 Gallons
Leak Detection: **ON**
Threshold set at 5 Gallons

Download Report ?

Enter timeframe

Water Use:

Choose ...

DOWNLOAD

WaterSmart Toolbox- Customer Daily Use

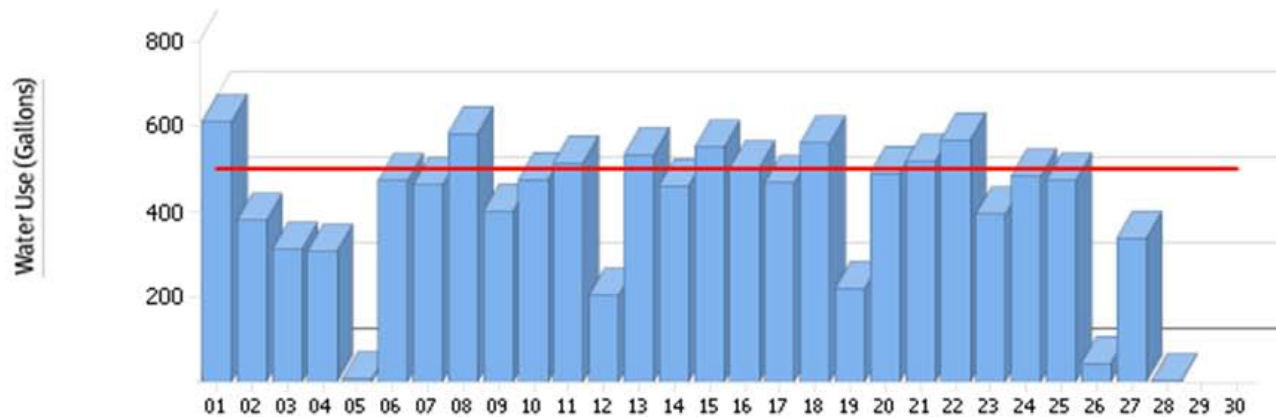


User Lookup

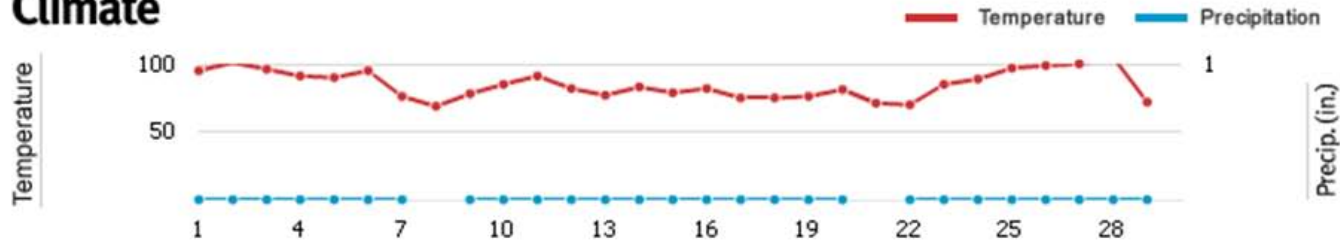
Account #123452

Daily Water Usage

Daily usage for September 2010



Climate



Quick View

Yearly Monthly **Daily** Hourly

[Table View](#)

Climate

☒ Temperature ?

☒ Precipitation ?

Settings

[Edit](#)

Daily Limit: **ON**

Alert sent at 500 Gallons

Leak Detection: **ON**

Threshold set at 10 Gallons

Download Report ?

Water Use:

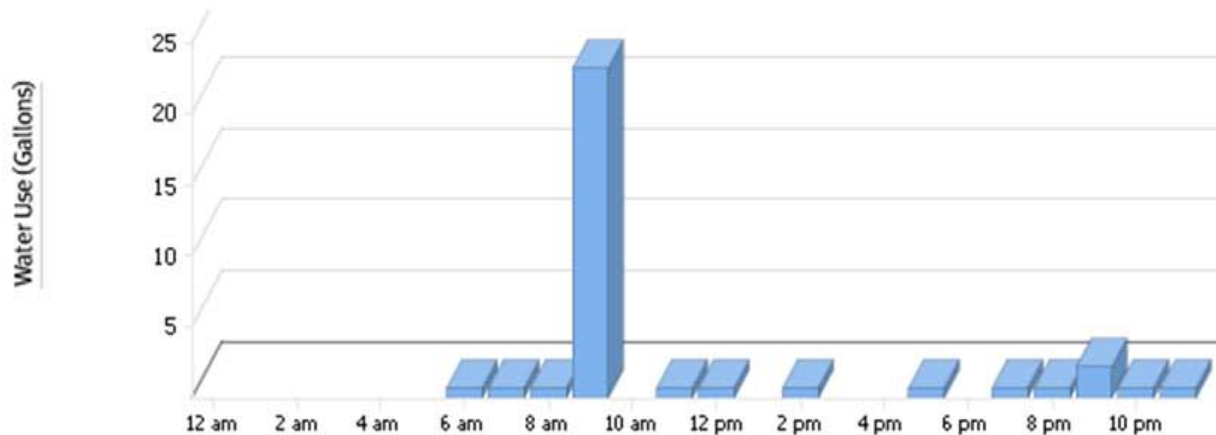
DOWNLOAD

WaterSmart Toolbox-Customer Hourly screen

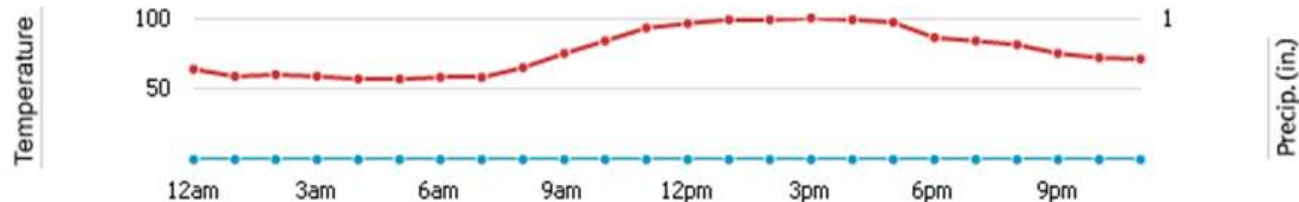


Hourly Water Usage

Hourly usage for 2010-09-27



Climate



Quick View

Yearly Monthly Daily **Hourly**

[Table View](#)

Climate

- ☒ Temperature ?
- ☒ Precipitation ?

Settings

[Edit](#)

Chart Units: **Gallons**

Daily Limit: **ON**

Alert sent at 500 Gallons

Leak Detection: **ON**

Threshold set at 10 Gallons

Download Report ?

Enter timeframe

Water Use:

Choose ...

DOWNLOAD

The Settings Page



WATER USAGE

SETTINGS

Account
#1 234 52

[Sign Out](#)

Settings



Email Notification

Up to three email addresses may be configured to receive Leak Detection Alerts, Daily Limit Alerts and general System Messaging.

You have no emails configured.

[Add Email addresses](#)



Daily Limit Alerts

Monitor water usage by setting a Daily Limit Alert. When the limit is reached in a given day, a notification can be sent out via email.

Alerts: **ON** Daily Limit: **780 Gallons** Alert Frequency: **Daily** [Edit Settings](#)



Leak Detection

Automatically detect potential water leaks by watching for perpetual (non-zero) hourly usage throughout the day. The threshold per hour can be set above zero to avoid false alert triggers.

Leak Detection: **ON** Threshold: **1 Gallons** Alert Frequency: **Weekly** [Edit Settings](#)



Chart Preferences

Set default chart parameters, which are used to configure the initial chart view on Sign In.

Chart Units: **Gallons**

Quick View: **Daily**

Climate Data: **None**

[Edit Preferences](#)



Password

Select a new password for this account.

[Change Password](#)



Conservation Tips

Don't Be a Drip

Fix leaky faucets. Constant drips are not just annoying, but also a huge waste of water. You can lose about 20 gallons of water per day from a single drippy faucet.

Setting up email notification



WATER USAGE

SETTINGS

Settings



Email Notification

Up to three email addresses may be entered below and configured to receive Leak Detection Alerts, Daily Limit Alerts and general account messaging.

Email Address:

Used for:

George@myhouse.com



Daily Limit



Leak Detection



General Account

George@mywork.com



Daily Limit



Leak Detection



General Account

MyPlumber@Work.com



Daily Limit



Leak Detection



General Account

Save Notifications

[Cancel](#)

[No Title]



Setting up the Daily Limit



WATER USAGE

SETTINGS

Settings



Daily Limit Alert

Monitor water usage by setting a Daily Limit Alert. When the limit is reached in a given day, a notification can be sent out via email.

☐ OFF ☒ ON

Daily Limit:

Gallons per day

Gallons per day

Notification Frequency:

Billing Units

Save Daily Limit

[Cancel](#)



Setting up Chart Preferences



WATER USAGE

SETTINGS

Settings



Chart Preferences

Select your default chart parameters below. They will be used to configure the initial chart view.

Chart Units:

Gallons ▼
Gallons
Cubic Feet
Billing Units

Climate Data:

- ☐ Temperature
☐ Precipitation

Save Chart Settings

[Cancel](#)

Setting up Passwords



WATER USAGE

SETTINGS

Settings



Change Password

Enter your current password, then select a new password.

Enter Current Password:

Enter New Password:

Enter New Password Again:

Save

[Cancel](#)

Downloading reports



Welcome to WaterSmart Toolbox!

EBMUD water SMART TOOLBOX

WATER USAGE **SETTINGS**

Account #128452 [Sign Out](#)

Daily Water Usage

Daily usage for September 2010

Water Use (Gallons)

Climate

Temperature Precipitation

Temperature (in.)

Quick View

[Table View](#)

Climate

☒ Temperature [?](#)

☒ Precipitation [?](#)

Settings

[Edit](#)

Chart Units: **Gallons**

Daily Limit: **ON**

Alert sent at 500 Gallons

Leak Detection: **ON**

Threshold set at 10 Gallons

Download Report

[?](#)

Water Use:

DOWNLOAD

Specific Date [?](#)

Date range [?](#)

Start date

End date

Su Mo Tu We Th Fr Sa

Su Mo Tu We Th Fr Sa

Done

WaterSmart Toolbox- Admin Site



SIMON SAVES

Welcome, admin | [Logout](#)

Admin Controls

MANAGE ADMINS

USER LOOKUP

REPORTS

SYSTEM MESSAGES

Home



[Manage Admins](#)

Create and modify up to thirty site administrators.



[User Lookup](#)

Search for a user and view and modify their account.



[Reports](#)

View Water Usage, Leak Detection and System Access.



[System Messages](#)

Broadcast a system-wide message to all user accounts.

Welcome to your Admin Home.

Use the selections to the left to add more admins, look up users, pull reports or broadcast messages across the system.

Aggregate Consumption 2009



SIMON SAVES

Welcome, admin | [Logout](#)

[Admin Controls](#)

[MANAGE ADMINS](#)

[USER LOOKUP](#)

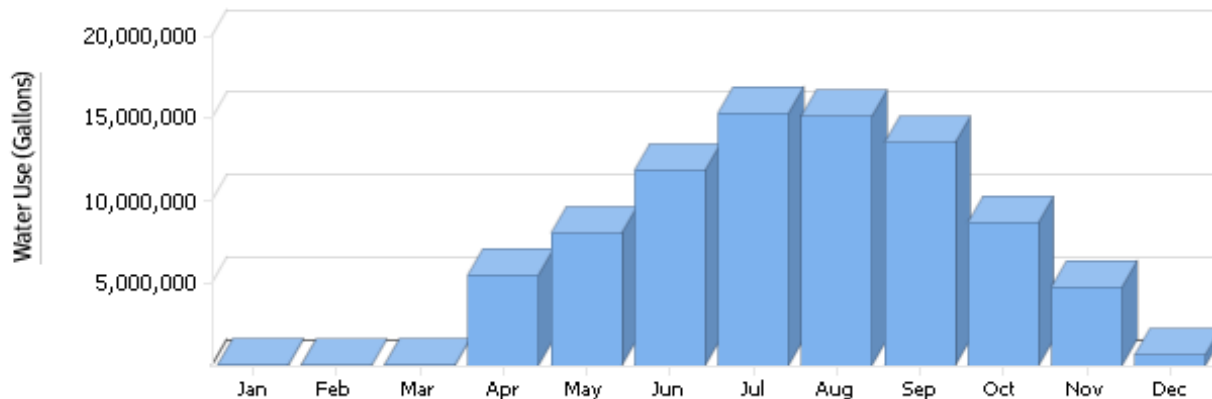
[REPORTS](#)

[SYSTEM MESSAGES](#)

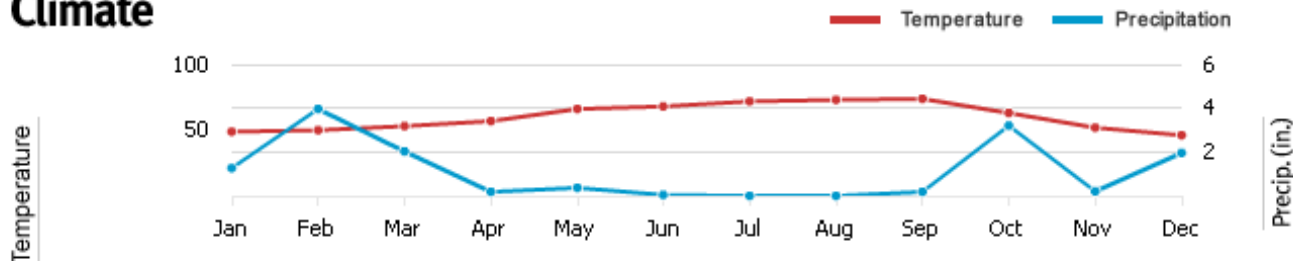
Reports > Water Usage

Monthly Water Usage

Jan - Dec 2009



Climate



Quick View

[Yearly](#) [Monthly](#) [Daily](#) [Hourly](#)

Meter Read Report

- ☐ Monthly Reads
☐ Daily Reads
☐ Hourly Reads

Select Month 2009

[DOWNLOAD](#)

Consumption Report

Enter timeframe

Filter: Usage is greater than

Gallons

[DOWNLOAD](#)

Does usage track temperature?



SIMON SAVES

Welcome, admin | [Logout](#)

[Admin Controls](#)

[MANAGE ADMINS](#)

[USER LOOKUP](#)

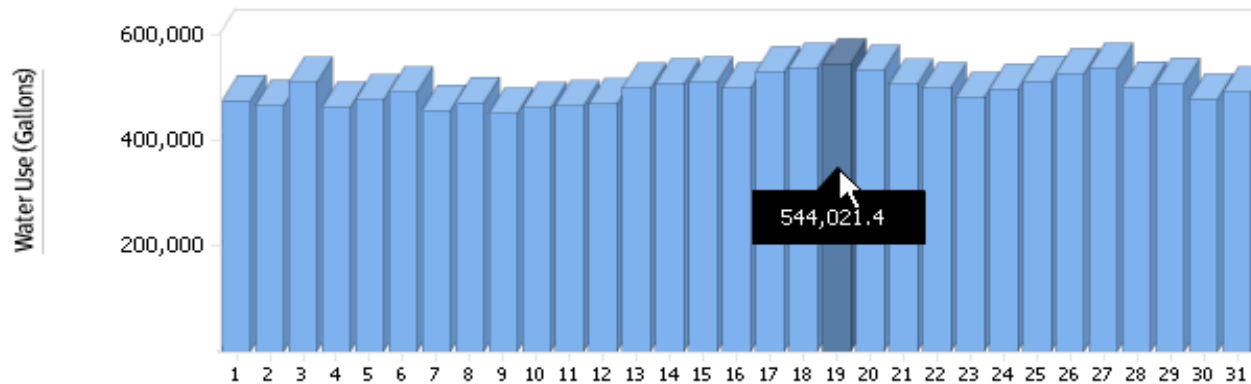
[REPORTS](#)

[SYSTEM MESSAGES](#)

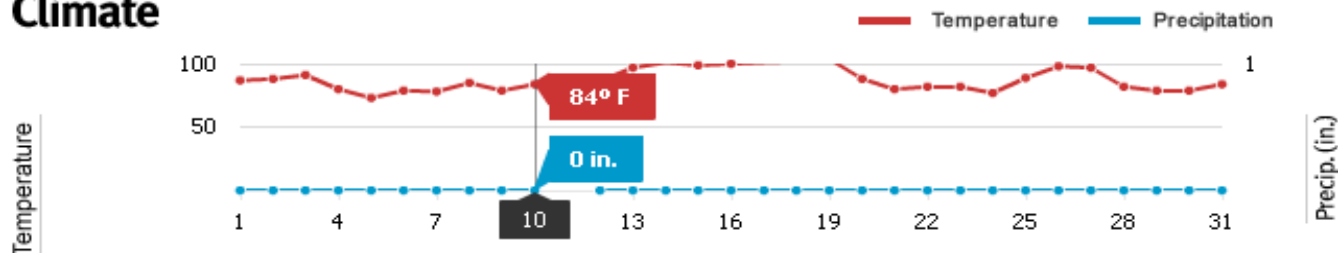
Reports > Water Usage

Daily Water Usage

Daily usage for Jul 2009



Climate



QuickView

[Yearly](#) [Monthly](#) [Daily](#) [Hourly](#)

Meter Read Report

- ☐ Monthly Reads
- ☐ Daily Reads
- ☐ Hourly Reads

Select Month 2009

[DOWNLOAD](#)

Consumption Report

Enter timeframe

Filter: Usage is greater than

Gallons

[DOWNLOAD](#)

Does usage track rainfall?



SIMON SAVES

Welcome, admin | [Logout](#)

[Admin Controls](#)

[MANAGE ADMINS](#)

[USER LOOKUP](#)

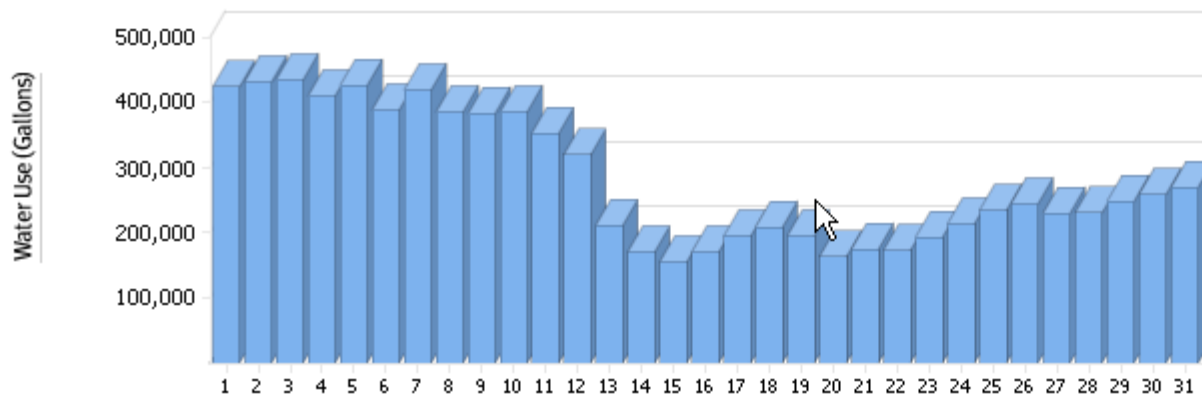
[REPORTS](#)

[SYSTEM MESSAGES](#)

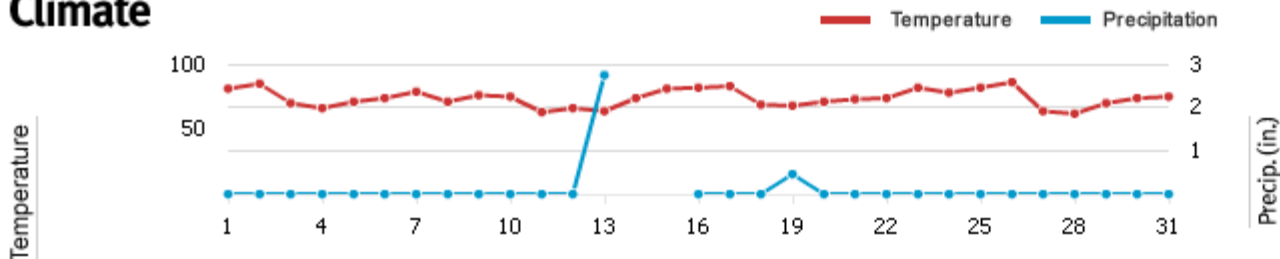
Reports > Water Usage

Daily Water Usage

Daily usage for Oct 2009



Climate



Quick View

[Yearly](#) [Monthly](#) [Daily](#) [Hourly](#)

Meter Read Report

- ☐ Monthly Reads
☐ Daily Reads
☐ Hourly Reads

Select Month 2009

[DOWNLOAD](#)

Consumption Report

Enter timeframe

Filter: Usage is greater than

Gallons

[DOWNLOAD](#)

Aggregate hourly usage profile



SIMON SAVES

Welcome, admin | [Logout](#)

[Admin Controls](#)

[MANAGE ADMINS](#)

[USER LOOKUP](#)

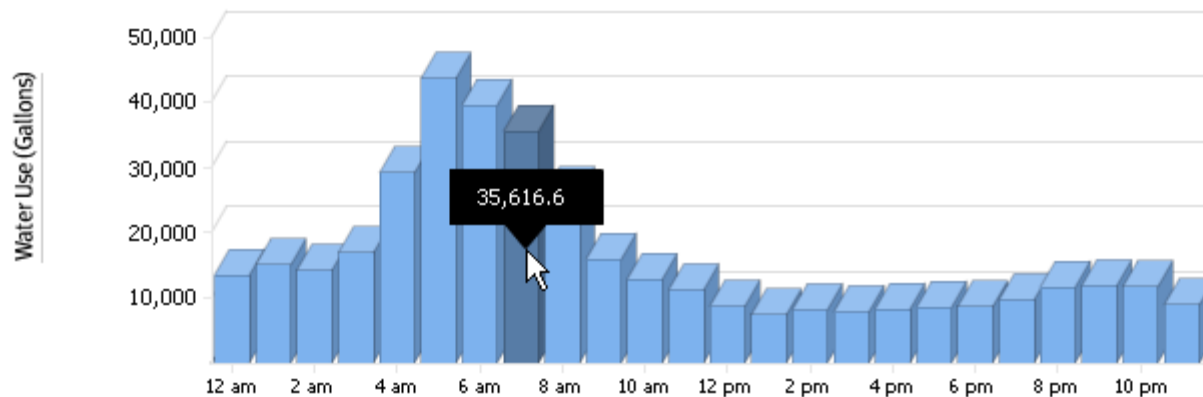
[REPORTS](#)

[SYSTEM MESSAGES](#)

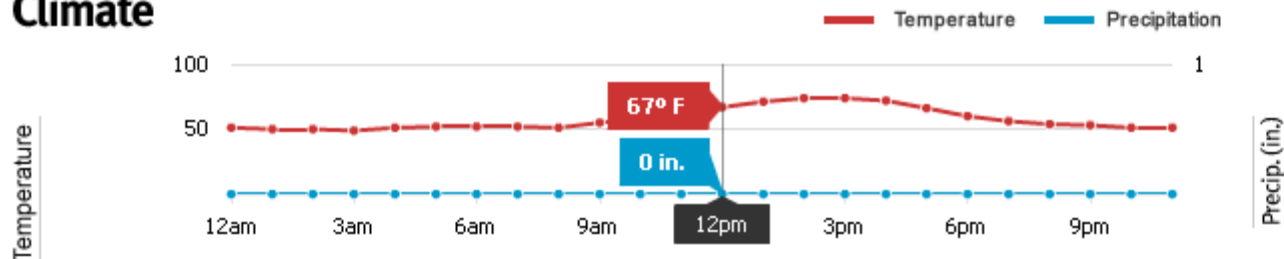
Reports > Water Usage

Hourly Water Usage

Hourly usage for 10/10/2009



Climate



Quick View

[Yearly](#) [Monthly](#) [Daily](#) [Hourly](#)

Meter Read Report

- ☐ Monthly Reads
☐ Daily Reads
☐ Hourly Reads

Select Month: 2009

[DOWNLOAD](#)

Consumption Report

Enter timeframe

Filter: Usage is greater than

Gallons

[DOWNLOAD](#)

Who has a leak today?



Admin Controls

MANAGE ADMINS

USER LOOKUP

REPORTS

SYSTEM MESSAGES

Reports > Leak Detection

Active Leaks

| Account | Last Detection | # of Days | Controls |
|---------|-----------------------------|-----------|-----------------------|
| | September 29, 2010, 9:00 am | 197 | Reset |
| | September 29, 2010, 9:00 am | 105 | Reset |
| | September 29, 2010, 9:00 am | 100 | Reset |
| | September 29, 2010, 9:00 am | 65 | Reset |
| | September 29, 2010, 9:00 am | 48 | Reset |
| | September 29, 2010, 9:00 am | 43 | Reset |
| | September 29, 2010, 9:00 am | 42 | Reset |
| | September 29, 2010, 9:00 am | 42 | Reset |
| | September 29, 2010, 9:00 am | 42 | Reset |
| | September 29, 2010, 9:00 am | 42 | Reset |

Account #s
hidden

Download Report

Download all detected leaks:

DOWNLOAD

WaterSmart Toolbox Next Steps



- 💧 Water budgets and benchmarking use based on indoor usage and daily evapotranspiration
- 💧 Data mining tools to evaluate savings achieved from AMI and other conservation programs
- 💧 Real time financial calculator using rate tiers
- 💧 Fixed network leak detection system integration
- 💧 Additional research on ET controllers
- 💧 Distribution system optimization review and full AMI deployment Implementation plan

Conclusion: AMR/AMI Benefits



- Improved Customer Service

- Water Conservation

 - Water use surveys

 - Leak detection

 - Drought management

 - Program evaluation

- Demand Analyses

 - System leak detection

 - Pressure zone balancing

 - Meter decay and sizing

 - Facility sizing

